

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (original): An optical waveguide comprising:
- a bottom boundary material;
 - a precursor waveguide material deposited on the bottom boundary material, the precursor waveguide material formed from a two-component plasma reaction in a substantially air-evacuated plasma chamber, a first component of the two-component plasma reaction comprising a non-carbon containing and non-oxygenated silicon donor, and a second component of the two-component plasma reaction comprising a non-silicon containing and non-oxygenated organic precursor, the precursor waveguide material comprising:
 - a waveguide core; and
 - a side boundary material formed by selectively photo-oxidizing a region of the precursor waveguide material adjacent to the waveguide core by exposing the region of the precursor waveguide material to a radiated electromagnetic energy in the presence of oxygen to form the side boundaries of the waveguide core; and
 - a top boundary material formed over the precursor waveguide material.
2. (original): The optical waveguide of claim 1 wherein the second component of the two-component plasma reaction is selected from the group consisting of alkanes, alkenes, alkynes, phenyls and aromatic hydrocarbons.
3. (original): The optical waveguide of claim 1 wherein the second component of the two-component plasma reaction is selected from the group consisting of ethylene, methane, ethane and toluene.
4. (original): The optical waveguide of claim 1 wherein the first component of the two-component plasma reaction is selected from the group consisting of monosilane, disilane and dichlorsilane.
5. (original): The optical waveguide of claim 4 wherein the second component of the two-component plasma reaction is selected from the group consisting of ethylene, methane, ethane and toluene.
6. (canceled)

7. (canceled)
8. (canceled)
9. (canceled)
10. (canceled)
11. (canceled)
12. (canceled)
13. (original): A vertically stacked, multiple waveguide core, plasma deposited waveguide structure comprising:

an at least two waveguide core layers, each of the at least two waveguide core layers formed from a two-component plasma reaction in a substantially air-evacuated plasma chamber, a first component of the two-component plasma reaction comprising a non-carbon containing and non-oxygenated silicon donor, and a second component of the two-component plasma reaction comprising a non-silicon containing and non-oxygenated organic precursor, wherein an at least one region of an each one of the at least two waveguide core layers is selectively photo-oxidized by exposing the at least one region to a radiated electromagnetic energy in the presence of oxygen, the at least two waveguide core layers arranged in a stack having a first layer and a last layer;

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a barrier layer disposed between the each one of the at least two waveguide core layers, the barrier layer comprising a material for blocking transmission of the radiated electromagnetic energy;

a bottom boundary material disposed over the first layer of the at least two waveguide core layers, the bottom boundary layer forming a first end layer of the plasma deposited waveguide structure; and

a top boundary material disposed over the last layer of the at least two waveguide core layers, the top boundary material forming a second end layer of the plasma deposited waveguide structure, whereby a light signal is selectively guided through each of the at least two waveguide core layers.

14. (canceled)
15. (canceled)

16. (currently amended): The ~~optical-waveguide~~ waveguide structure of claim ~~14~~ 13 wherein the second component of the two-component plasma reaction is selected from the group consisting of alkanes, alkenes, alkynes, phenyls and aromatic hydrocarbons.

17. (currently amended): The ~~optical-waveguide~~ waveguide structure of claim ~~14~~ 13 wherein the second component of the two-component plasma reaction is selected from the group consisting of ethylene, methane, ethane and toluene.

18. (currently amended): The ~~optical-waveguide~~ waveguide structure of claim ~~14~~ 13 wherein the first component of the two-component plasma reaction is selected from the group consisting of monosilane, disilane and dichlorsilane.

19. (currently amended): The ~~optical-waveguide~~ waveguide structure of claim ~~18~~ wherein the second component of the two-component plasma reaction is selected from the group consisting of ethylene, methane, ethane and toluene.

20. (new): An optical waveguide comprising:

a bottom boundary material;

a precursor waveguide material deposited on the bottom boundary material, the precursor waveguide material formed from a two-component plasma reaction in a substantially air-evacuated plasma chamber, a first component of the two-component plasma reaction comprising a non-carbon containing and non-oxygenated silicon donor, and a second component of the two-component plasma reaction comprising a non-silicon containing and non-oxygenated organic precursor, the precursor waveguide material comprising:

a side boundary material; and

a waveguide core formed by selectively photo-oxidizing a region of the precursor waveguide material in the side boundary material by exposing the region to a radiated electromagnetic energy in the presence of oxygen; and

a top boundary material formed over the precursor waveguide material.

21. (new): The optical waveguide of claim 20 wherein the second component of the two-component plasma reaction is selected from the group consisting of alkanes, alkenes, alkynes, phenyls and aromatic hydrocarbons.

22. (new): The optical waveguide of claim 20 wherein the second component of the two-component plasma reaction is selected from the group consisting of ethylene, methane, ethane and toluene.

23. (new): The optical waveguide of claim 20 wherein the first component of the two-component plasma reaction is selected from the group consisting of monosilane, disilane and dichlorsilane.

24. (new): The optical waveguide of claim 23 wherein the second component of the two-component plasma reaction is selected from the group consisting of ethylene, methane, ethane and toluene.

25. (new): An optical waveguide comprising:

a bottom boundary material;

an at least two layers of precursor waveguide material deposited on the bottom boundary material, each of the at least two layers of precursor waveguide material formed from a two-component plasma reaction in a substantially air-evacuated plasma chamber, a first component of the two-component plasma reaction comprising a non-carbon containing and non-oxygenated silicon donor, and a second component of the two-component plasma reaction comprising a non-silicon containing and non-oxygenated organic precursor, each of the at least two layers of the precursor waveguide material comprising:

a waveguide core formed in at least one of the at least two layers of the precursor waveguide material by selectively photo-oxidizing a first region of the precursor waveguide material by exposing the first region of the precursor waveguide material to a radiated electromagnetic energy in the presence of oxygen; and

a side boundary material formed by selectively photo-oxidizing a second region of the precursor waveguide material adjacent to the waveguide core by exposing the second region of the precursor waveguide material to a radiated electromagnetic energy in the presence of oxygen to form the side boundaries of the waveguide core; and

a top boundary material formed over the at least two layers of precursor waveguide material.

26. (new): The optical waveguide of claim 25 wherein the second component of the two-component plasma reaction is selected from the group consisting of alkanes, alkenes, alkynes, phenyls and aromatic hydrocarbons.

27. (new): The optical waveguide of claim 25 wherein the first component of the two-component plasma reaction is selected from the group consisting of monosilane, disilane and dichlorsilane.

28. (new): The optical waveguide of claim 27 wherein the second component of the two-component plasma reaction is selected from the group consisting of ethylene, methane, ethane and toluene.

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